	Application No.	Applicant(s)
Notice of Allowability	10/695,149	ITO ET AL.
	Examiner	Art Unit	
	Neveen Abel-Jalil	2165	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *April 27, 2006*.

2. ☒ The allowed claim(s) is/are *25-35, 37-40, & 42-43*.

3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a) ☒ All   b) ☐ Some*   c) ☐ None of the:

        1. ☒ Certified copies of the priority documents have been received.

        2. ☐ Certified copies of the priority documents have been received in Application No. _____ .

        3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

    * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.

    (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached

        1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.

    (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of

        Paper No./Mail Date _____.

    Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)

2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)

3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____

4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material

5. ☐ Notice of Informal Patent Application (PTO-152)

6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .

7. ☒ Examiner's Amendment/Comment

8. ☒ Examiner's Statement of Reasons for Allowance

9. ☐ Other _____.

Neveen Abel-Jalil
AU # 2165

Remarks

1.   The After-Final Amendment filed on 27-April-2006 has been received and entered.

Claims 1-24, 36, and 41, have been cancelled. Therefore, claims 25-35, 37-40, and 42-43 are

pending.

EXAMINER'S AMENDMENT

2.   An examiner's amendment to the record appears below. Should the changes and/or

additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR

1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the

payment of the issue fee.

     Authorization for this examiner's amendment was given in a telephone interview with

Mr. George B. F. Yee (Attorney of Record) on June 5, 2006.

Amendments to the Claims:

3.   This listing of the claims will replace all prior versions, and listings, of claims in the

application:

Listing of Claims:

4.   The application has been amended as follows:

     1-24.   (Canceled)

25.   (Currently amended) A The computer system of claim 29,

wherein said first node includes a first input/output (I/O) interface via which said first node is coupled to said first disk controller, and said second node includes a second I/O interface via which said second node is coupled to said second disk controller,

wherein said first path information further includes a first disk controller ID designating said first disk controller, and a first I/O interface ID designating said first I/O interface,

wherein said second path information further includes a second disk controller ID designating said second disk controller, and a second I/O interface ID designating said second I/O interface.

26.   (Currently amended) A The computer system of claim 29, further comprising a third node coupled to said first node and said second node via said network, said third node including said file management table and said logical disk management table,

wherein when said third node detects a fault in said first node, said third node sends said second node a request for changing to change an access path to said logical disk,

said second node changes said first status information and said second status information in said logical disk management table in order to change an access path to said logical disk, and sends said logical disk ID, said changed first path information, and said changed second path information to other nodes coupled to said network, and

wherein said other nodes can are configured to update their respective logical disk management tables based on data received from said second node.

27.   (Currently amended) A The computer system of claim 26,

wherein if when an access request issued from one of said other nodes to said logical disk times out, then said one of said other nodes selects an access path to said logical disk based on its updated logical disk management table.

28.   (Currently amended) A The computer system of claim 26,

wherein when said third node detects a fault in said first node, said third node

selects a path which becomes unavailable and a corresponding path whose status is waiting, and

said third node sends said request for changing to change an access path to said

second node, said second node is coupled to said logical disk via said corresponding path.

29.   (Currently amended) A computer system comprising:

a first node coupled to a physical disk via a first path;

a second node coupled to said physical disk via a second path, said second node

being coupled to said first node via a network; and

said physical disk connecting to a first disk controller and to a second disk

controller, said first disk controller being coupled to said first node via said first path, said

second disk controller being coupled to said second node via said second path,

each of said first node and said second node comprising:

a disk driver for performing to perform disk I/O processing;

a file management table including a file ID and a logical disk ID of a

logical disk, said logical disk being a storage area in said physical disk and storing a file

corresponding to said file ID; and

a logical disk management table including said logical disk ID, a first path

information designating said first path, and a second path information designating said

second path, said first path information including a first node ID designating said first

node and first status information designating status of said first path, and said second path

information includes a second node ID designating said second node and second status

information designating status of said second path,

each of said first node and said second node configured to select a path for

accessing to access said logical disk, if when it receives an access request including said

file ID, said path being selected based on said received file ID, said file management

table, and said logical disk management table,

wherein when said disk driver determines that said first path becomes unavailable, said first node configured to respond by:

changing said first status information and said second status information in said logical disk management table ~~in order~~ to change an access path to said logical disk; and

sending said logical disk ID, said changed first path information, and said changed second path information to other nodes coupled to said network,

wherein one of said other nodes coupled to said network is coupled to a disk storing a mount construction file, said mount construction file including a node ID designating a node which exists on a path, and a path status designating a status of said path, and

said one of said other nodes creates said logical disk management table based on said mount construction file.

30.   (Currently amended) ~~A~~ The computer system of claim 29,

wherein said mount construction file further includes an I/O interface ID designating an I/O interface which exists on said path, and a disk controller ID designating a disk controller which exists on said path.

31.   (Currently amended) ~~A~~ The computer system of claim 30,

wherein said one of nodes sends said logical disk management table to one or more of said other nodes coupled to said network.

32.   (Currently amended) ~~A~~ The computer system of claim 30,

when said first path becomes unavailable and one of said other nodes receives said logical disk ID, said changed first path information, and said changed second path information from said first node, said one of said other nodes updating its mount construction file.

33.   (Currently amended) A The computer system of claim 29,

wherein each of said first node and said second node further includes a buffer cache ~~for storing~~ to store data to be written into said logical disk, and

when said first path becomes unavailable before storing data from said buffer cache of said first node into said logical disk, said first node sends said data to said second node, and said second node stores said data into said logical disk via said second path.

34.   (Currently amended) A The computer system of claim 29,

wherein said file management table further includes file management information which is updated based on a received write request,

when said file management information is updated, each of said first node and said second node stores said file management table into said physical disk, and

when said first path becomes unavailable before said updated file management table in said first node is stored into said physical disk, said first node sends data in said updated file management table to said second node, and said second node writes said received data into said physical disk.

35.   (Currently amended) A The computer system of claim 29,

wherein each of said first disk controller and said second disk controller includes a disk cache ~~for storing~~ to store data to be stored in said physical disk, and

when said first path becomes unavailable before data stored in said disk cache of said first disk controller is stored in said physical disk, said second node issues a command ~~for writing~~ to write said data in said disk cache into said physical disk via said second disk.

36.   (Canceled)

37.   (Currently amended) A The first node of claim 39,

wherein said first node is coupled to a disk storing a mount construction file, said mount construction file including a path status information designating a status of a path and a node ID designating a node which exists on said path, and

wherein said first node creates said logical disk management table according to said mount construction file, and sends it to other nodes coupled to said network.

38.   (Currently amended) A The first node of claim 37,

wherein when said first node changes said status information of said first path and said second path, said first nodes updates said mount construction file.

39.   (Currently amended) A first node comprising:

a first I/O interface for coupling coupled to a physical disk via a first disk controller, said physical disk coupled to said second node via a second disk controller and a second I/O interface;

a disk driver to perform I/O operations with said physical disk;

a file management table including a file ID and a logical disk ID of a logical disk, said logical disk being a storage area in said physical disk and storing a file corresponding to said file ID; and

a logical disk management table including said logical disk ID, a first path information designating a first path through said first node, and a second path information designating a second path through said second node, each of said first path information and said second path information including a node ID designating a node on said path, and a status information designating availability of said path,

wherein when said status information of said first path is available and said status information of said second path is waiting, said first node selects said first path for accessing to access a file designated by said file ID which is included in an access request,

wherein when disk driver detects that said first path becomes unavailable, said first node changes said status information of said first path to unavailable, changes said status

information of said second path to available, and sends said logical disk ID, a changed first path information, and a changed second path information to said second node ~~in order~~ to change a path used ~~for accessing~~ to access said logical disk,

wherein said first node further comprises a buffer cache ~~for storing~~ to store data to be written into said logical disk,

wherein when said first path becomes unavailable before storing data stored in said buffer cache into said logical disk, said first node sends said data to said second node to store said data into said logical disk via said second path.

40. (Currently amended) ~~A~~ The first node of claim 39,

wherein said file management table further includes file management information which is updated based on a received write request,

wherein when said file management information is updated, said first node stores said file management table into said physical disk, and

wherein when said first path becomes unavailable before said updated file management table is stored into said physical disk, said first node sends data in said updated file management table to said second node to store said data into said physical disk via said second path.

41. (Canceled)

42. (Currently amended) A second node comprising:

a second I/O interface ~~for coupling~~ coupled to a physical disk via a second disk controller, said physical disk being coupled to said first node via a first disk controller and a first I/O interface;

a disk driver to perform I/O processing with said physical disk;

a file management table including a file ID and a logical disk ID of a logical disk, said logical disk being a storage area in said physical disk and storing a file corresponding to said file ID; and

a logical disk management table including said logical disk ID, a first path information designating a first path to said logical disk through said first node, and a second path information designating a second path to said logical disk through said second node, each of said first path information and said second path information including a node ID designating a node on said path, and a status information designating availability of said path,

wherein when said status information of said first path is available and said status information of said second path is waiting, said second node receives an access request including said file ID and transfers said access request to said first node via said network thereby accessing said logical disk through said first path,

wherein when said disk driver detects that said first path becomes unavailable, said second node changes said status information of said first path to unavailable and changes said status information of said second path to available in order to change a path used for accessing to access said logical disk wherein when said first node stores data to be written into said physical disk in said first node and said first path becomes unavailable before said data stored in said first node is written into said physical disk, said second node receives said data from said first node and writes said data into said physical disk.

43.   (Currently amended) A The second node of claim 42,

wherein said first disk controller includes a disk cache for storing to store data to be written into said physical disk,

wherein when said first path becomes unavailable before data stored in said disk cache is written into said physical disk, said second node issues a command for writing to write said data stored in said disk cache into said physical disk.
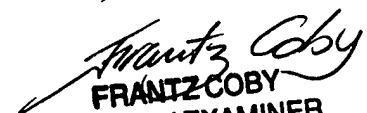
Allowance

5.   Claims 25-35, 37-40, and 42-43 are allowed over the prior art made of record.

6.   Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

7.   Any inquiry concerning this communication or earlier communications from the examiner should be directed to Neveen Abel-Jalil whose telephone number is 571-272-4074. The examiner can normally be reached on 8:30AM-5:30PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jeffrey A. Gaffin can be reached on 571-272-4146. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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PRIMARY EXAMINER

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